What is claimed is:

1. A method, for evaluating the reflection coating uniformity of an optical component that has a concave reflective optical surface, that comprises the steps of:

(a) providing an illumination source of divergent radiation having a first wavelength;

(b) positioning the optical component so that its concave reflective optical surface transforms diverging radiation from the source of divergent radiation into a converging beam at a focused point where an image of the source of divergent radiation is created;

(c) positioning a spatially imaging radiation detector far from the focused point such that substantially the entire surface of the detector is illuminated by the beam reflected from the concave surface;

(d) creating a recorded image by recording a first image that is reflected from the concave reflective optical surface to thereby geometrically map lateral positions on the concave reflective optical surface of the optical component to lateral positions of the spatially imaging detector;

(e) analyzing intensity variations across the recorded image to determine reflectivity variations across the optical surface;

(f) extrapolating reflection coating uniformity information from the reflectivity variations; and

(g) optionally, repeating steps (a) through (b) one or more times as desired using divergent radiation with a different wavelength in each repetition.

2. The method of claim 1 wherein the optical component is positioned so that substantially the entire concave reflective optical surface of the optical component transforms a portion of the diverging radiation.

3. The method of claim 1 wherein step (a) comprises providing a divergent extreme ultraviolet (EUV) radiation source and wherein the spatially imaging detector is EUV radiation sensitive.

4. The method of claim 3 wherein the detector is a charge coupled detector.

5. The method of claim 1 wherein the spatially imaging detector comprises an (EUV)-sensitive scintillator plate that is re-imaged using visible light optics to a visible-light charge coupled detector.

6. The method of claim 5 wherein the scintillator plate includes a yttrium aluminum garnet (YAG) material.

7. The method of claim 5 wherein the scintillator plate includes a $Bi_4Ge_3O_{12}$ (BGO) material.

8. The method of claim 1 wherein steps (a) through (f) are repeated at least once.

9. The method of claim 1 wherein radiation from source of divergent radiation is not scanned across the concave reflective optical surface.

10. The method of claim 1 wherein step (f) is achieved by comparing said reflectivity map to a reference reflectivity map where the reference map is recorded using steps (a) through (e) from a nominally identical but independently characterized reference optic.

11. The method of claim 1 wherein the multilayer reflection film comprises alternating layers of a first material having a first refractive index and a second material having a second refractive index that is different the first refractive index.

12. The method of claim 1 wherein the multilayer reflection film comprises alternating layers of molybdenum and silicon.

13. The method of claim 1 wherein the multilayer reflection film comprises about 10 to 200 layer pairs.

14. The method of claim 1 wherein the layer pairs have a periodicity of about 5 nm to 100 nm.

15. The method of claim 11 wherein the multilayer reflection film comprises about 10 to 200 layer pairs.

16. The method of claim 11 wherein the layer pairs have a periodicity of about 5 nm to 100 nm.

17. The method of claim 12 wherein the multilayer reflection film comprises about 10 to 200 layer pairs.

18. The method of claim 12 wherein the layer pairs have a periodicity of about 5 nm to 100 nm.

19. The method of claim 1 wherein the concave reflective optical surface that transforms diverging radiation in step (b) has an area of at least 10 mm^2.

20. The method of claim 19 wherein the area is between 800 and 80,000 mm^2.

21. A method, for evaluating the coating uniformity of an optical component that has a convex or flat reflective optical surface, that comprises the steps of:

(a) providing an illumination source of divergent radiation having a first wavelength;

(b) positioning a concave optic which transforms the illumination source into a convergent beam;

(c) positioning the optical component under evaluation so that its convex or flat reflective optical surface is illuminated by the convergent beam;

(d) positioning a spatially imaging detector such that substantially the entire beam reflected from the convex or flat reflective surface is projected onto said detector;

(e) creating a recorded image by recording a first image that is reflected from the convex or flat reflective optical surface to thereby geometrically map lateral positions on the convex or flat reflective optical surface of the optical component to the lateral positions of the spatially imaging detector;

(f) analyzing intensity variations across the recorded image to determine the reflectivity variations across the optical surface;

(g) extrapolating the reflection coating uniformity information from the reflectivity variations; and

(h) optionally, repeating steps (a) through (g) one or more times as desired using divergent radiation with a different wavelength in each repetition.

22. The method of claim 21 wherein the optical component under evaluation is positioned so that substantially the entire convex or flat reflective optical surface of the optical component is illuminated by the convergent beam.

23. The method of claim 21 wherein step (a) comprises providing a divergent extreme ultraviolet (EUV) radiation source and wherein the spatially imaging detector is EUV radiation sensitive.

24. The method of claim 21 wherein the detector is a charge coupled detector.

25. The method of claim 21 wherein the spatially imaging detector comprises an EUV-sensitive scintillator plate that is re-imaged using visible light optics to a visible-light charge coupled detector.

26. The method of claim 21 wherein the scintillator plate includes a yttrium aluminum garnet (YAG) material.

27. The method of claim 21 wherein the scintillator plate includes a $Bi_4Ge_3O_{12}$ (BGO) material.

28. The method of claim 21 wherein steps (a) through (g) are repeated at least once.

29. The method of claim 21 wherein radiation from source of divergent radiation is not scanned across the concave or flat reflective optical surface.

30. The method of claim 21 wherein step (g) is achieved by comparing said reflectivity map to a reference reflectivity map where the reference map is recorded using steps (a) through (f) from a nominally identical but independently characterized reference optic.

31. The method of claim 21 wherein the multilayer reflection film comprises alternating layers of a first material having a first refractive index and a second material having a second refractive index that is different than the first refractive index.

32. The method of claim 21 wherein the multilayer reflection film comprises alternating layers of molybdenum and silicon.

33. The method of claim 21 wherein the multilayer reflection film comprises about 10 to 200 layer pairs.

34. The method of claim 21 wherein the layer pairs have a periodicity of about 5 nm to 100 nm.

35. The method of claim 31 wherein the multilayer reflection film comprises about 10 to 200 layer pairs.

36. The method of claim 31 wherein the layer pairs have a periodicity of about 5 nm to 100 nm.

37. The method of claim 32 wherein the multilayer reflection film comprises about 10 to 200 layer pairs.

38. The method of claim 32 wherein the layer pairs have a periodicity of about 5 nm to 100 nm.

39. The method of claim 21 wherein the optical component has a convex surface.

40. The method of claim 21 further comprising the steps of determining the reflectivity uniformity of the concave optic and normalizing the reflection coating uniformity information extrapolated in step (g).

41. The method of claim 40 wherein the step of determining the reflectivity uniformity of the convex or flat optic comprises evaluating the reflection coating

uniformity of the concave optic which has a concave reflective optical surface, that comprises the steps of:

(i) providing an illumination source of divergent radiation having a second wavelength;

(ii) positioning the concave optical component so that its concave reflective optical surface transforms diverging radiation from the source of divergent radiation into a converging beam at a focused point where an image of the source of divergent radiation is created;

(iii) positioning a spatially imaging radiation detector far field from a convergent point of the illumination source of divergent radiation;

(iv) creating a recorded image by recording a second image that is reflected from the concave reflective optical surface to thereby geometrically map lateral positions on the concave reflective optical surface of the optical component to lateral positions of the second spatially imaging detector;

(v) analyzing intensity variations across the recorded image to determine reflectivity variations across the concave optical surface;

(vi) extrapolating reflection coating uniformity information from the reflectivity variations; and

(vii) optionally, repeating steps (a) through (b) one or more times as desired using divergent radiation with a different wavelength in each repetition.

42. The method of claim 21 wherein the concave or flat optic that transforms diverging radiation in step (b) has an area of at least 10 mm^2 onto which the divergent radiation is illuminated in step (a).

43. The method of claim 42 wherein the area is between 800 and 80,000 mm^2.